



RU-C2 Remedial Action



Groundwater, Soil and Soil Vapor Characterization In Support of Remedial Action at RU-C2

Hunters Point Shipyard
March 2011

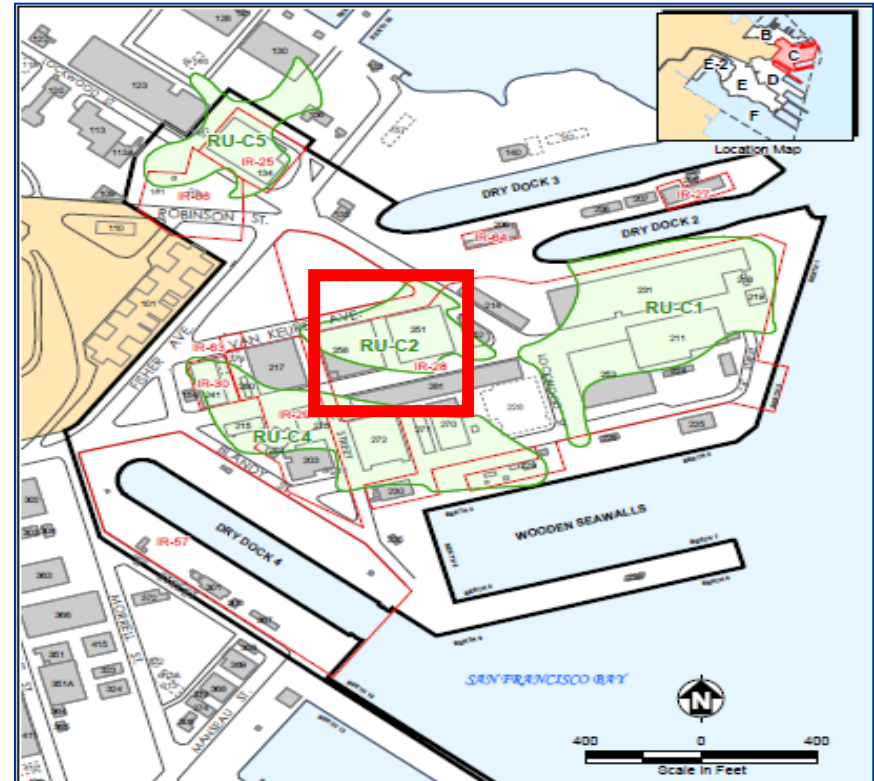




RU-C2 Overview



- RU-C2: Located west of RU-C1 and north of RU-C4
- Key Features- Buildings 258 and 251
- Two VOC plumes in groundwater
- Primary Groundwater COCs- TCE, PCE, chlorobenzene
- Primary soil COCs- arsenic, lead, zinc, PAHs



RU-C2 Location Map

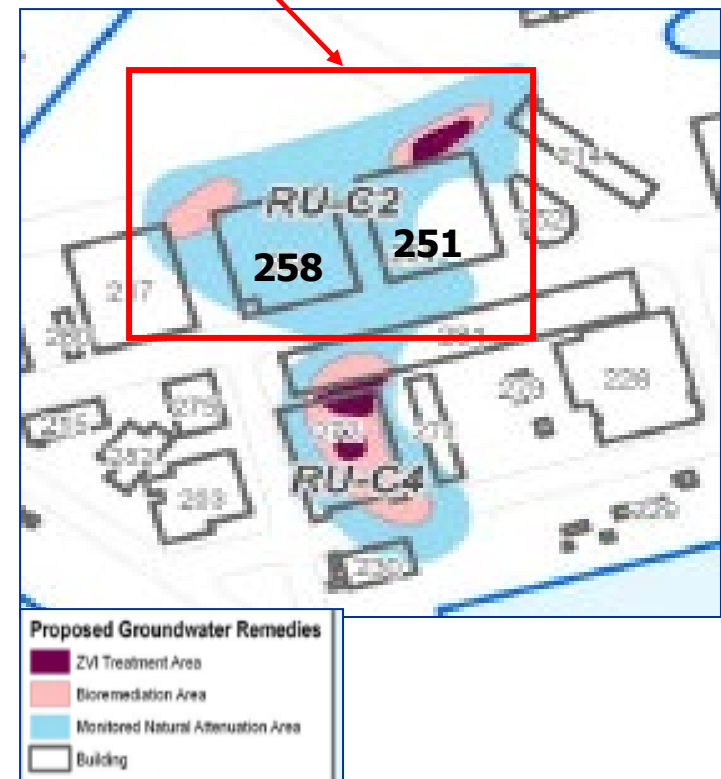


ROD Summary- Groundwater



- Remedial Action Per Final ROD
- In-situ remediation of VOCs in groundwater
 - ZVI Remediation Area
 - PCE > 15 ug/L
 - TCE > 110 ug/L
 - Bioremediation Area
 - VOCs exceed respective RGs by 10-50 times after ZVI injections
 - MNA Area

RU-C2 groundwater remediation area

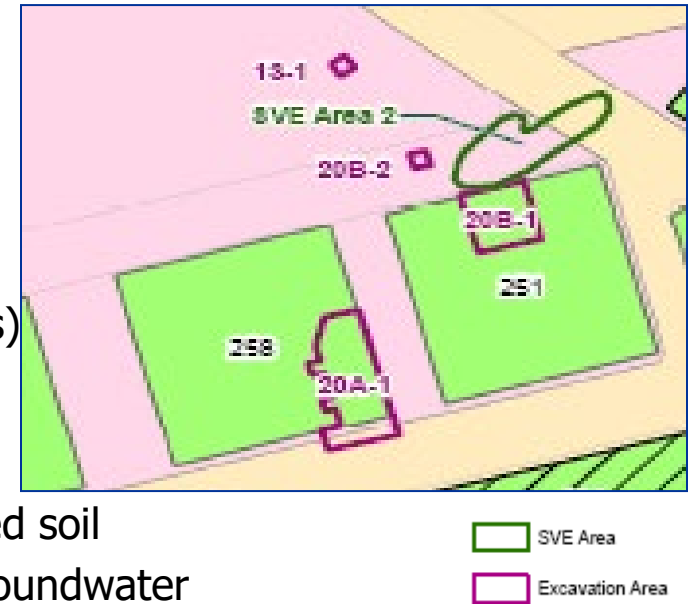




ROD Summary



- Soil Excavation
 - As, Pb, CVOCs, PAHs, and ZN exceed RG's
 - 20A-1 Building 258 (metals, VOCs, PCBs, PAHs)
 - 20B-1 Building 251 (VOCs, PCBs)
 - 20B-2 and 13-1 "Hot Spot" Areas (metals, PAHs)
- Soil Vapor Extraction
 - Source reduction measure for VOC contaminated soil
 - Coincidental with locations of VOC-impacted groundwater
 - Definition of SVE Limits
 - Previous soil detections
 - Future Soil Vapor Sampling

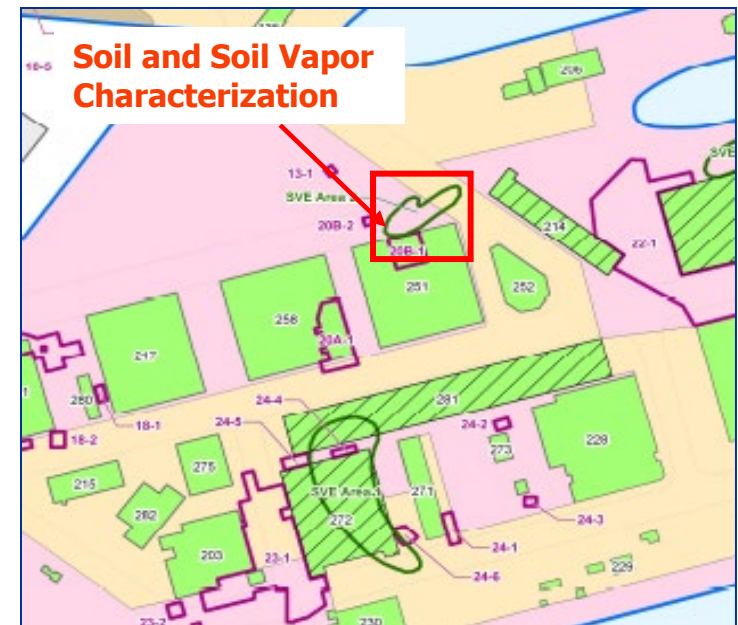
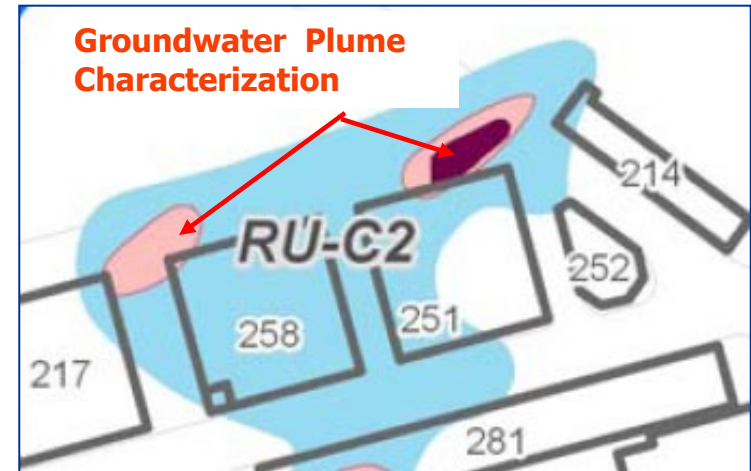




Pre-Design Investigation



- Pre-design investigation work plan
 - Purpose: VOC plume characterization in support of in-situ remediation
 - Soil and grab groundwater investigation
 - Purpose: Define area warranting soil vapor extraction (SVE)
 - Collocated soil and soil vapor investigation
 - Supporting data from ongoing base-wide soil vapor survey



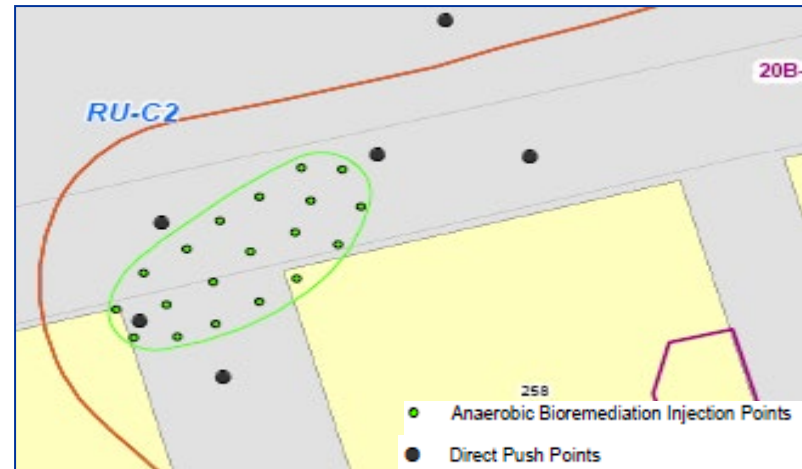


Pre-Design Investigation Activities

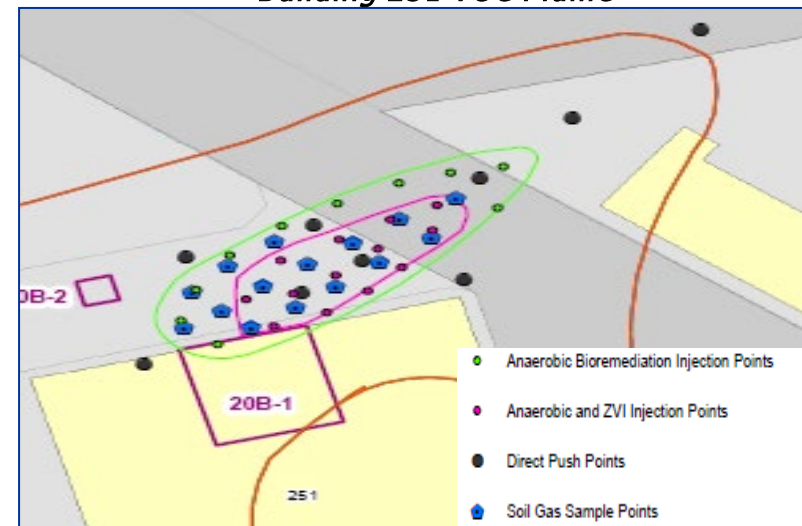


- Pre-Design soil and grab groundwater investigation
 - 15 Hydropunch locations
 - Building 258 VOC Plume
 - 6 Hydropunches targeting Building 258 plume
 - Building 251 VOC Plume
 - 9 Hydropunches targeting Building 251 plume
 - Soil and grab groundwater sampling
 - VOCs, SVOCs, PAHs, Metals, bio-indicator parameters

Building 258 VOC Plume



Building 251 VOC Plume

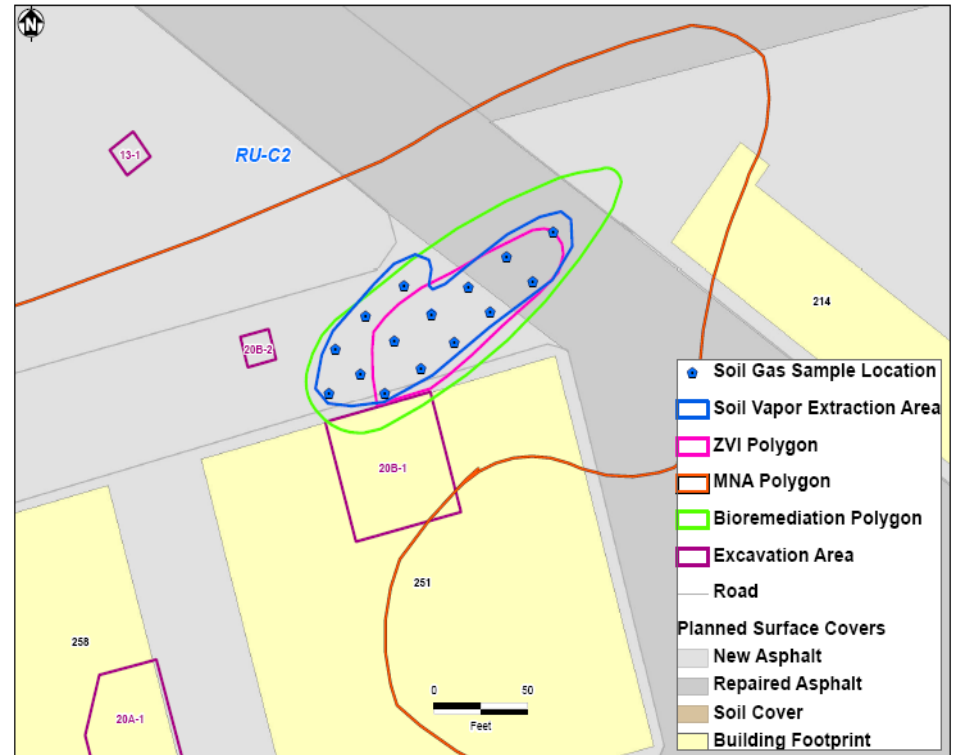




Soil and Soil Vapor Characterization



- Soil and soil vapor characterization
 - 15 locations, collocated soil and soil gas
 - VOC and TO-15 analyses of samples
- Additional data from base-wide soil vapor survey and groundwater monitoring program





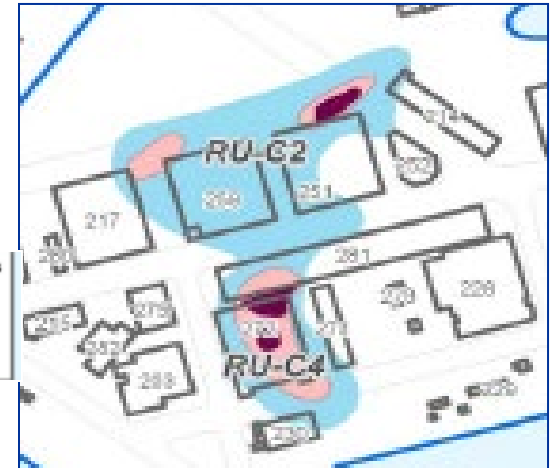
Future Activities



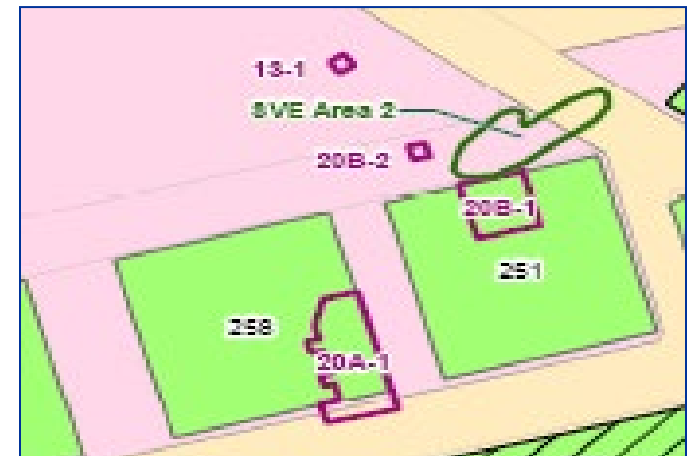
- Future Investigation and Remediation Activities
 - Remedial Action Workplan
 - Groundwater monitoring well decommissioning and installation
 - In-situ remediation of groundwater
 - ZVI Injections
 - Anaerobic bio-substrate injections
 - Aerobic bio-substrate injections (Optional)
 - Baseline and post-injection monitoring
 - Soil remediation
 - Soil excavation
 - SVE operations
 - Parcel-wide soil vapor sampling
 - Removal of SD/SS and clearance of RAD impacted buildings
 - Excavations as part of the TPH program

Proposed Groundwater Remedies

- ZVI Treatment Area
- Bioremediation Area
- Monitored Natural Attenuation Area
- Building



□ SVE Area
□ Excavation Area

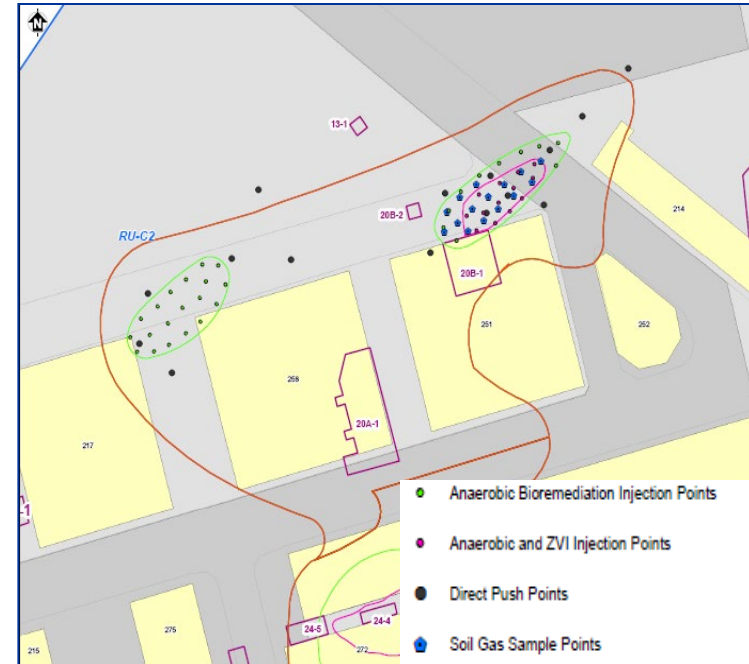




Estimated Schedule



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|---|------------------|
| • Draft Pre-Design Work Plan Submittal | May 2011 |
| • Regulatory review | May - June 2011 |
| • Working meeting with BCT | Mid June 2011 |
| • Respond to comments, submit Final Work Plan | July 2011 |
| • Mobilization/preparatory activities | Late July 2011 |
| • Perform Pre-Design Investigation | July-August 2011 |
| • Working meeting with BCT – mid field work | August 2011 |
| • Demobilization | Late August 2011 |
| • Summarize/present results | September 2011 |



Distribution of Field Activities-RU-C2